PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
P045045PCT mbu		

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/NL 03/00267	09.04.2003	09.04.2002

International Patent Classification (IPC) or both national classification and IPC
H01H33/66

Applicant
CLH HOLLAND N.V.

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
05.11.2003	24.09.2004

Name and mailing address of the international preliminary examining authority:

European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized Officer

Mäki-Mantila, M

Telephone No. +49 89 2399-7615

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/NL 03/00267

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-5	as originally filed

Claims, Numbers

2-4	as originally filed
1	filed with telefax on 31.08.2004

Drawings, Sheets

1/2-2/2	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	
	No:	Claims	1-4
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-4
Industrial applicability (IA)	Yes:	Claims	1-4
	No:	Claims	

2. Citations and explanations

   see separate sheet

1. **Prior art**

Reference is made to the following documents:
D1: US-A-4962289
D2: DE-U-9205493

2. **Novelty**

2.1 Independent claim

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT with respect to either D1 or D2.

The document D1 discloses (the references in parentheses applying to this document):
a ceramic tube (5) for use in a vacuum circuit breaker (see figs. 3 and 5), the ceramic tube (5) being cylindrical in shape with a set length and a set internal diameter, with a cylindrical end face at each end of the cylinder shape (see fig. 5), being possible for a metal end cap (14b) to be secured in a vacuum-tight manner to each cylindrical end face to form a vacuum chamber, wherein the cylindrical end face is shaped in such a manner that, in the assembled state, it makes contact with the metal end cap (14b) at least as far as the internal diameter of the ceramic tube (5).
Because of the geometry of the triple junction of metal end cap (14b) ceramic tube (5) and vacuum chamber the concentration of the electrical field in the triple junction is weaker than in the case when the cylindrical end face of the ceramic tube would have a bevelled shape.

The subject-matter of claim 1 is therefore not novel (Article 33(2) PCT) over document D1.

The document D2 discloses (the references in parentheses applying to this document):
a ceramic tube (2) for use in a vacuum circuit breaker (see fig. 1), the ceramic tube (2) being cylindrical in shape with a set length and a set internal diameter, with a cylindrical end face at each end of the cylinder shape, being possible for a metal end cap (3) to be secured in a vacuum-tight manner to each cylindrical end face to form

a vacuum chamber, wherein the cylindrical end face is shaped in such a manner that, in the assembled state, it makes contact with the metal end cap (3) at least as far as the internal diameter of the ceramic tube (2).
Because of the geometry of the triple junction of metal end cap (3) ceramic tube (2) and vacuum chamber the concentration of the electrical field in the triple junction is weaker than in the case when the cylindrical end face of the ceramic tube would have a bevelled shape.

The subject-matter of claim 1 is therefore not novel (Article 33(2) PCT) over document D2.

2.2 Dependent claims

The document D2 also discloses (see fig. 1):

- a ceramic tube (2) according to claim 1, in which the cylindrical end face on an inner side of the ceramic tube (2) forms an angle of substantially 90° with an inner surface of the ceramic tube (2);
- a ceramic tube (2) according to claim 1 or 2, in which the cylindrical end face on an outer side of the ceramic tube (2) forms an angle of at least 90° with an outer surface of the ceramic tube (2).

The subject-matter of claims 2 and 3 is therefore not novel (Article 33(2) PCT) over document D2.

The document D2 also discloses (see fig. 1 and claim 1):
a vacuum circuit breaker provided with a ceramic tube (2) according to any one of Claims 1 to 3.

The subject-matter of claim 4 is therefore not novel (Article 33(2) PCT) over document D2.

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amended claims

1. Ceramic tube for use in a vacuum circuit breaker, the ceramic tube (3) being cylindrical in shape with a set length and a set internal diameter, with a cylindrical end face (11) at each end of the cylinder shape, it being possible for a metal end cap (4,6) to be secured in a vacuum-tight manner to each cylindrical end face (11) to form a vacuum chamber (8), characterized in that the cylindrical end face (11) is shaped in such a manner that, in the assembled state, it makes contact with the metal end cap (4, 6) at least as far as the internal diameter of the ceramic tube (3) in order to prevent, in operation of the vacuum circuit breaker, a concentration of electrical field at the triple junction of metal end cap (4, 6), ceramic tube (3) and vacuum chamber (8).

2. Ceramic tube according to Claim 1, in which the cylindrical end face (11) on an inner side of the ceramic tube (3) forms an angle of substantially at most 90° with an inner surface (13) of the ceramic tube (3).

3. Ceramic tube according to Claim 1 or 2, in which the cylindrical end face (11) on an outer side of the ceramic tube (3) forms an angle of at least 90° with an outer surface of the ceramic tube (3).

4. Vacuum circuit breaker (10) provided with a ceramic tube (3) according to one of Claims 1 to 3.